

## **AES MIXCOLUMN TRANSFORM**

A simplified logic circuit for performing the AES Rijndael MixColumns transform exploits the common relationship between each of the successive rows of the transform matrix and its preceding row. A logic circuit for performing multiplication of an  $(m \times n)$  matrix by a  $(1 \times n)$  or by a  $(m \times 1)$  matrix, where m is a number of rows and n is a number of columns, and where each successive row, m, of n elements is a predetermined row permutation of a preceding row comprises: n multiplication circuits; n logic circuits; n registers for receiving logical output from the logic circuits; feedback logic for routing the contents of each register to a selected one of inputs of the logic circuits in accordance with a feedback plan that corresponds to the common relationship between successive matrix rows; and control means for successively providing as input to each of the n multiplication circuits each element in the  $(1 \times n)$  or  $(m \times 1)$  matrix.

(Figure 2)

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